Tank Cleaning (T-AO)

1 PURPOSE

To minimize the risks associated with tank cleaning on board MSC ships.

2 APPLICABILITY: Current release date: **January 2021**

3 BACKGROUND & PROCEDURES

3.1 It is generally recognized that tank cleaning and gas freeing is the most hazardous period of tanker operations. This is true whether washing for clean ballast, gas freeing for entry, or gas freeing for hot work. It is therefore essential that the greatest possible care is exercised in all operations connected with tank cleaning and gas freeing.

3.2 Safety

3.2.1 The Cargo Mate or Chief Mate shall conduct a pre-cleaning safety brief each day. This briefing shall include, but is not limited to tank safety, confined space rescue, review of tank cleaning plan, and Personnel Protective Equipment (PPE.) The briefing shall be attended by all personnel involved in cleaning and logged by the Watch Officer.

3.2.2 Personnel entering and working around tanks shall carry no loose items in pockets and shall not wear watches or jewelry.

3.2.3 Portable electric lights and extension cords shall be intrinsically safe. Light cords and electrical extension cords shall be inspected for breaks in the insulation. Lights shall be unplugged during setup, movement, and removal. Lighting shall be suspended by a rope and not the electrical cord.

3.2.4 Cover all butterworth openings when not in use.

3.3 Ventilation of Cargo Tanks: The goal of ventilation is to make the tank's atmosphere gas free in the shortest possible time.

3.3.1 The tank shall be emptied and stripped. Positioning the ship by shifting ballast or cargo, to ensure the rose box is the tank's low point, will maximize the effectiveness of the stripping system.

3.3.2 Covers of all tank openings should be kept closed until ventilation of the tank is about to commence.

3.3.3 Portable blowers or fans should be hydraulically or pneumatically driven. All electrical equipment shall be intrinsically safe.

3.3.4 All fans shall have a bonding cable for static discharge.

3.3.5 Many hydrocarbon vapors are heavier than air. Ventilation equipment needs to be powerful enough to cause air flow at the bottom of the tank. Water driven ram fans with elephant trunks are very effective. A trunk through the Butterworth hole, with one fan for supply and one for suction, at opposite corners of the tank is an effective method.

3.3.6 Tank gasses should be vented so they escape the deck as quickly as possible.

3.3.7 Tank gasses should be vented so they are well away from the air supply to the pump room and house. If not practicable, ventilation to these spaces may need to be secured.

3.3.8 Tank gasses may be in the explosive range when gas freeing commences. All precautions observed during cargo handling shall be in effect.

3.4 Gas Freeing of Cargo Tanks

3.4.1 SMS Procedures 2.1-001-ALL, Confined Space Entry and 2.1-020-ALL, Gas Free Engineer shall be followed.

3.4.2 When testing tanks containing Diesel Fuel Marine (DFM) or Jet Fuel (JP-5), concentrations of the following toxins shall be determined and the combined Permissible Exposure Limit (PEL) calculated. This procedure is explained in Attachment 1, 2.1-020-ALL, Gas Free Engineer.

- Benzene
- Toluene

3.5 Portable Tank Washing Machines and Hoses

3.5.1 All hoses should be tested for electrical continuity in a dry condition prior to use and in no case should the resistance exceed 6 ohms per meter length.

3.5.2 Bonding wires should be incorporated within all water hoses. Couplings should be connected in such a way that effective bonding is ensured.

3.5.3 When suspended within a cargo tank, machines should be supported by means of a rope and not by the water supply hose.

3.5.4 After use, Butterworth Machines should be flushed with fresh water and lubricated according to manufacturer's instructions.

3.5.5 Always keep the hose connected to the hydrant when the butterworth machine is in the tank. Remove machine before disconnecting hose.

3.6 Water Washing of Cargo Tanks

3.6.1 Cycle times of Butterworth Machines are affected by fire main pressure. Operating manuals should be consulted to determine cycle times.

3.6.2 The tank should be kept drained during washing. Washing should be stopped to clear any build-up of wash water.

3.6.3 Wash times and drop heights vary by tank, product, and time between cleanings. A tank cleaning plan should be prepared by the Cargo Mate and reviewed by the Chief Mate and Master / OIC to ensure goals are met.

3.6.4 When transferring wash water to shore facility, SMS Procedure 7.4-002-ALL, Lube Oil / Waste Oil / Oily Waste External Transfer apply.

3.7 Water Washing of Cargo Tanks at Sea

3.7.1 All procedures in section 3.6 apply.

3.7.2 All wash water should be allowed to settle. Oil water interface should by determined by sounding. Water below interface should be discharged over the side through the Oil Content Monitor (OCM). Discharge should be observed to ensure no sheen is left on the water.

3.8 Removal of Sludge, Scale, and Sediment

3.8.1 SMS Procedures 2.1-001-ALL, Confined Space Entry shall be followed.

3.8.2 Equipment shall be marked by the manufacturer as intrinsically safe.

3.8.3 All sludge, scale, sediment, and rags shall be considered hazmat and disposed in accordance with SMS Procedure 2.2-008-ALL, Hazardous Material (HM) Handling.

3.9 Tank Closing

A pre-closing tank inspection shall be conducted by the Cargo Mate or person designated by the Master. At a minimum, the following items shall be checked:

- Rose box.
- Bell mouths of the main cargo and stripping lines.
- Sounding tube and striker plate.
- Verity that no rags or loose gear were left in the tank.
- Ensure vents and vent lines are clear.
- If used, ensure all line blanks and plugs have been removed.
- If nylon threaded nuts are used to secure covers, nuts must be replaced after a single use. Ensure three threads are showing above each nut after tightening.

4 RECORDS & REPORTS

4.1 Gas Free Certificates, SMS Checklist 2.1-020-01

4.2 Confined Space Entry Checklist, SMS Checklist 2.1-001-01

4.3 SMS Procedure 2.1-001-ALL, Confined Space Entry

4.4 SMS Procedure 2.1-020-ALL, Gas Free Engineer

4.5 SMS Procedure 2.2-008-ALL, Hazardous Material (HM) Handling

5 REFERENCES

5.1 International Safety Guide for Oil Tankers and Terminals (ISGOTT), 5th Edition

5.2 Naval Ship's Technical Manual Chapter 074, Volume 3 – Gas Free Engineering

6 DEFINITIONS

6.1 **Oily Waste:** Oil mixed with water or other fluids (e.g. Bilge water) such that the mixture is no longer useful. Oily waste has greater than 5 percent water content.

6.2 **Permissible Exposure Limit (PEL):** The maximum permissible concentration of a toxic chemical or exposure level of a harmful physical agent to which personnel may be exposed. PEL is based on a time weighted average (TWA) for a normal 8–hour day, 40–hour, 7–day week.

7 REVISIONS

Original	16 Nov 2007
Rev 0.1	07 Mar 2011 – Updated paragraph 3.7.2 to clarify use of OCM.
Rev 0.2	05 Dec 2019 – Procedure title modified to make consistent throughout fleet.